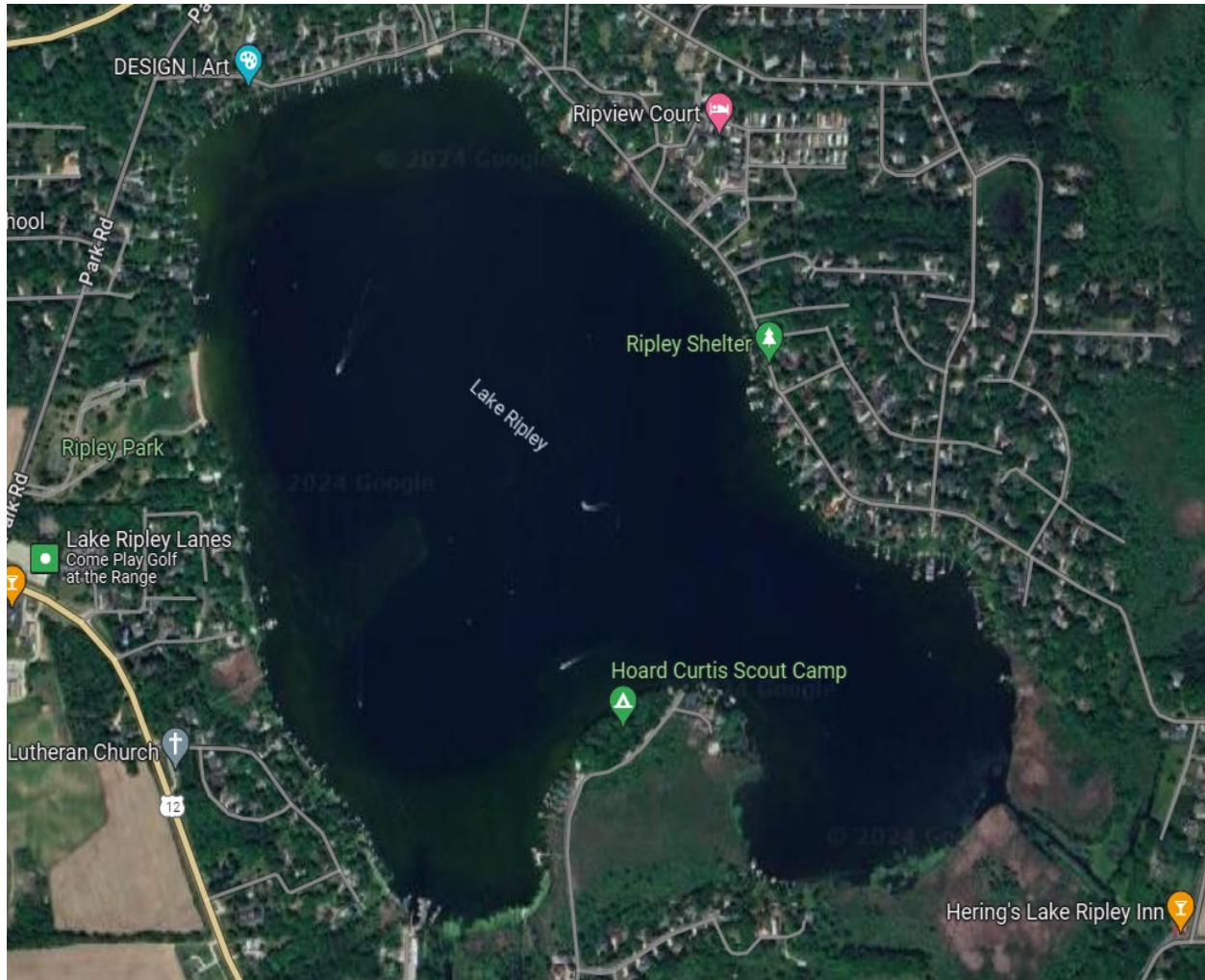


# WISCONSIN DEPARTMENT OF NATURAL RESOURCES

## Fisheries Survey Report of Lake Ripley, Jefferson County, Wisconsin 2023

WATERBODY IDENTIFICATION CODE 809600



Mark Baldock  
DNR Senior Fisheries Biologist  
Horicon, Wisconsin  
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## Executive Summary

In 2023, a comprehensive fishery survey was conducted on Lake Ripley using a variety of sampling methods throughout the open water period to sample the major components of the fishery. The objectives of the survey were to 1) assess the status of the northern pike (*Esox lucius*), walleye (*Sander vitreus*), largemouth bass (*Micropterus salmoides*) and panfish populations, 2) attain a population estimate for northern pike and walleye and 3) update management recommendations for the fishery of Lake Ripley. The results of the 2023 survey were compared to lakes with similar characteristics and the prior comprehensive fishery survey the Department of Natural Resources (DNR) conducted on Lake Ripley in 2016. Based on the 2023 survey results, Lake Ripley continues to offer quality fishing opportunities for northern pike, walleye, largemouth bass, pumpkinseed (*Lepomis gibbosus*) and bluegill (*Lepomis macrochirus*).

Northern pike catch rates between survey years were relatively similar with 0.9 /net night in the 2016 spring fyke netting (SNI) survey, and 1.1 /net night in 2023. These rates are in the 35<sup>th</sup> and 43<sup>rd</sup> percentile, respectively, for similar complex, warm, clear lakes. The percent of northern pike measured over the legal size limit of 26.0 inches increased from 12.4% in 2016 to 46.2% in 2023. The average length also increased from 18.0 inches in 2016 to 24.3 inches in 2023. The ratio of female to male northern pike flipped from 31.2% female and 41.2% male in 2016 to 56.3% female and 40.5% male in 2023. The population is self-sustained through natural reproduction as northern pike are not currently stocked into Lake Ripley. Future surveys should continue to closely monitor the population of northern pike as an important gamefish species.

Walleye catch rates were very similar in both survey years. Rates were 3.0/net night in 2016 and 2.9/net night in the 2023 survey. These are in the 56<sup>th</sup> and 55<sup>th</sup> percentile, respectively, for similar lakes. The average length of walleye sampled declined slightly from 18.5 inches in 2016 to 17.8 inches in 2023. The percent of walleye over the legal size limit of 15.0 inches also declined from 96.5% in 2016 to 83.2% in 2023. Male to female ratios of walleye in Lake Ripley remained consistent between survey years. In 2016, males accounted for 72.7% and females accounted for 24.9% of the population. In 2023, males accounted for 72.7% and females accounted for 24.5% of the population. Beginning in 2015, Lake Ripley has been stocked by the DNR or private hatcheries in odd years with large fingerling walleye at a rate of 20 per acre. This practice was discontinued due to a lack of reaching targeted goals for walleye adult abundance and young of year (YOY) catch rates, and the last stocking occurred in 2021.

Largemouth bass catch rates decreased slightly during spring electrofishing II (SEII) sampling from 61.3/mile (81<sup>st</sup> percentile) in 2016 to 44.3/mile (77<sup>th</sup> percentile) for similar lakes in 2023. The proportional size distribution (PSD), or the proportion of

fish sampled above a quality size (12 inches) compared to the stock size (8 inches) for the species decreased slightly from 31 in 2016 to 26 in 2023.

Bluegill catch rates increased slightly between 2016 (44.0/mile) and 2023 (48.0/mile). These rates are in the 21<sup>st</sup> and 22<sup>nd</sup> percentile, respectively, compared to similar lakes. PSD for bluegill also increased from 23 in 2016 to 44 in 2023. Future surveys should focus on bluegill growth and catch rates to determine if a more protective regulation on panfish is warranted.

Current DNR sampling protocols do not accurately assess yellow perch (*Perca flavescens*) or black crappie (*Pomoxis nigromaculatus*). Angler concerns about the yellow perch population led to a private stocking of 5,000 yearling perch in both 2018 and 2019. Angler concerns over the populations of these species may warrant more intensive sampling in the next survey to address the potential impacts and develop science-based decisions on their management.

**Management recommendations include:**

1. Monitor the northern pike population and reevaluate size structure, abundance, growth, length at age, relative weight and conduct a population estimate in the next comprehensive fishery survey. Monitor the abundance of quality and preferred sized northern pike.
2. Monitor the walleye population and reevaluate size structure, abundance, growth, length at age, relative weight and conduct a population estimate in the next comprehensive fishery survey.
3. Maintain a walleye abundance of at least 1.5 adults per acre. Use genetics to evaluate any potential walleye natural reproduction and evaluate the potential effects the 15-inch/daily bag of 3 regulation is having to help protect the species. Consider a more restrictive regulation if data shows a decline in size structure, growth, or population estimates for the species.
4. Monitor the largemouth bass population and reevaluate size structure, abundance, length at age, relative weight and growth in the next comprehensive fishery survey.
5. Consider alternative sampling techniques to collect quality data on the black crappie population to evaluate size structure, abundance, growth, length at age and relative weight in the next comprehensive fishery survey.
6. Monitor the bluegill population and reevaluate size structure, abundance, length at age, relative weight and growth in the next comprehensive fishery survey. Improve catch rates and PSD by exploring potential regulation changes to reduce harvest and protect the population.
7. Consider alternative sampling techniques to collect quality data on the yellow perch population to evaluate size structure, abundance, growth, length at age and relative weight in the next comprehensive fishery survey.
8. Monitor the relative abundance of common carp (*Cyprinus carpio*), via catch rates, in the next comprehensive fishery survey.

9. If funding is available, conduct a lake-wide creel survey to estimate angler harvest of all fish species in Lake Ripley.

## Introduction

Lake Ripley is a 420-acre, deep, lowland, mesotrophic drainage lake located in western Jefferson County (Figure 1). It lies within the town of Oakland. The village of Cambridge is located just west of the lake. The lake is formed by an impoundment of an unnamed tributary of Koshkonong Creek which is the major inlet that flows into Lake Ripley on the southeast end and exits on the northwest end of the lake. The lake has a maximum depth of 44 feet with an average depth of 18 feet. Several areas of Lake Ripley have recently been classified as critical habitat designations. The lake has an excellent mix of rocky, sandy, and muck substrates with ample littoral zone. It has good water quality for a mesotrophic deep lowland lake.

Documented invasive species include common carp, Chinese mystery snail (*Cipangopaludina chinensis*), curly-leaf pondweed (*Potamogeton crispus*), Eurasian water-milfoil (*Myriophyllum spicatum*), hybrid Eurasian/northern water-milfoil (*Myriophyllum spicatum* x *Myriophyllum sibiricum*), purple loosestrife (*Lythrum salicaria*), and zebra mussel (*Dreissena polymorpha*). The lake supports multiple rare fish species including the state special concern least darter (*Etheostoma microperca*) and lake chubsucker (*Erimyzon sucetta*).

One measure of a lake's health is the trophic state, which relates to the amount of algae in the water. Lake Ripley's average summer trophic state for the last 5 years was 48 (mesotrophic) and was determined using chlorophyll data. For a deep lowland lake, this is considered good. Deep lowland lakes stratify, or form separate layers of water, in the summer months and have a watershed greater than 4 square miles.

There is one public boat launch on the lake at the end of Island Lane on the south shore adjacent to the Hoard Curtis Scout Camp. The town of Oakfield operates and manages the launch. There is also a public swimming beach located on the west shore in Ripley Park. The lake includes 4.8 miles of shoreline that is primarily residential. The southeastern portion of the lake is locally known as Milwaukee Bay and is mostly lined by cattail and tamarack swamp. Recreational use is moderately high with most usage occurring during summer weekends.

The fishery is an important resource for anglers throughout Jefferson and surrounding counties. Its location off Highway 12 near Madison makes it a convenient destination for fishing and other water-based recreation. Northern pike, walleye, largemouth bass and smallmouth bass are the primary gamefish species. Bluegill, black crappie, yellow perch and pumpkinseed are the primary panfish species. Bluegill, pumpkinseed and yellow bullhead (*Ameiurus natalis*) are abundant. Walleye, northern pike, largemouth bass, black crappie, yellow perch, rock bass (*Ambloplites rupestris*), golden shiner (*Notemigonus crysoleucas*) and brown bullhead (*Ameiurus*



*nebulosus*) are common. Bowfin (*Amia calva*), white sucker (*Catostomus commersonii*), lake chubsucker (*Erimyzon sucetta*), black bullhead (*Ameiurus melas*), smallmouth bass (*Micropterus dolomieu*), bigmouth buffalo (*Ictiobus cyprinellus*) and common carp are present.

Lake Ripley received large fingerling walleye at 20/acre in alternate odd years (Table 1). The most recent fish stocking events include 8,360 large fingerling walleye from DNR West Central Region ponds in 2021, 8,360 large fingerling walleye from Gollon Bait and Fish Farm in 2019 and 8,396 large fingerling walleye from DNR Lake Mills State Fish Hatchery in 2017. Private fish stocking permits were issued by the DNR. The lake also received 5,000 yearling (4-inch) yellow perch through private stocking events using Gollon Bait and Fish Farm as the source in 2018 and 2019.

Current fishing regulations follow the general statewide inland regulations. The significance of the fishery and high, year-round public use justifies regular monitoring of the fish community to assess management options and maximize the potential of the fishery.

## Methods

This survey was scheduled to be completed in 2022, but since it was a part of the statewide Wisconsin Walleye Initiative (WWI), it was postponed for a year to allow three year classes of stocked large fingerling walleye to become susceptible to DNR sampling gear. On March 21, 2023, four white nylon fyke nets (0.8-inch bar mesh, 3 x 6-foot frames) were set in the southern shallow bay portions of Lake Ripley to target spawning northern pike. On March 22, 2023, three additional nets were set in Lake Ripley to target spawning walleye. Nets were checked daily and were removed as catch rates dropped. All nets were removed on April 16, 2023, for a total of 176 net nights of effort. All gamefish sampled were measured to the nearest 0.1 inch and weights were taken to the nearest 0.06 pound on a subsample of northern pike, walleye, largemouth bass, bluegill, pumpkinseed, black crappie and rock bass. To attain population estimates, northern pike and walleye were given a sex-specific fin clip. Males received a left pelvic fin clip, females received a right pelvic fin clip, and unknown fish received a top caudal (tail) fin clip. All largemouth and smallmouth bass were given top caudal fin clips to eliminate duplicate counts. Throughout the survey, northern pike, walleye, largemouth and smallmouth bass were examined for marks and noted as recaptures if marks were found. Additionally, aging structures were removed from northern pike, walleye, largemouth bass, black crappie, and bluegill according to standard sampling protocols for age and growth estimates for each species. These protocols included removing a pelvic fin ray from northern pike, a second or third anterior dorsal spine from walleye greater than 12 inches, scales from walleye less than 12 inches, dorsal spines and anal spines from largemouth bass greater than 10 inches, scales from largemouth bass less than 10 inches, and otoliths from black crappie and bluegill. Aging structures were collected until five structures

were collected for each species and each sex for every half inch increment. For most other species, a subsample was measured to the nearest 0.1 inch. Other fish species encountered in low numbers were identified to species and counted.

Spring electrofishing I (SEI) using a DNR standard pulsed direct current (PDC) boom shocker boat was conducted at night on April 26. Sampling used two probes (each with eight droppers), two dippers and a dip net bar mesh of 0.4 inches. One 5.2-mile transect around the lake was completed sampling exclusively for walleye. The objective was to identify walleye marked from the 2023 SNI survey to calculate a population estimate. Newly encountered walleye were measured to the nearest 0.1-inch.

Spring electrofishing II (SEII) using a DNR standard PDC boom shocker boat with two probes (each with eight droppers), two dippers and a dip net bar mesh of 0.4 inches, was conducted at night on May 22, targeting largemouth bass, panfish species and common carp. Two 2.0-mile stations along the shoreline were completed. For each 2.0-mile station, all fish species were sampled and catchable common carp were counted in the first 0.5-mile segment. Only largemouth and smallmouth bass were sampled in the remaining 1.5-mile segment. The total SEII effort was 4.0-miles for largemouth and smallmouth bass and 1.0-mile for all other species. At stations targeting all species, all fish were collected and gamefish and panfish were measured to the nearest 0.1 inch. Other fish were identified to species and counted. At stations targeting only largemouth and smallmouth bass, all largemouth and smallmouth bass sampled were measured to the nearest 0.1 inch. All gamefish were examined for the presence of fin clip marks from SNI. Age structures were taken from a subset of bluegill, black crappie, and largemouth bass.

Fall electrofishing (FE) using a DNR standard PDC boom shocker boat was conducted at night on October 23 to assess the abundance of young-of-the-year (YOY) and juvenile walleye that do not tend to be sampled by gear at other times of the year. One 4.3-mile transect around the lake was completed with only walleye being sampled. All walleye were measured to the nearest 0.1-inch and aging structures were taken from all walleye under 12.0 inches.

Relative weight, the ratio of a fish's weight to the weight of a standard fish of the same length based on a scale of 100, was used to assess body condition of northern pike, walleye and largemouth bass. Mean relative weight ( $W_r$ ) was calculated by length group as an index of northern pike, walleye and largemouth bass condition using a standard length-at-weight equation (Willis, 1989). Average relative weight was calculated for each species. Relative weight values between 75 and 100 indicate normal weight for a given length. A relative weight value greater than 100 indicates that a fish is in excellent condition. A relative weight value less than 75 indicates that a fish is in poor condition.

Proportional size distribution (PSD) was calculated for northern pike, walleye, largemouth bass, bluegill, black crappie, pumpkinseed and rock bass to assess population size-structure. PSD takes the number of quality length fish sampled divided by the number of stock length fish multiplied by 100 to produce a whole number that represents the proportion of the population that is of quality size. Each species has acceptable ranges of values that indicate a balanced population. Stock lengths are based on standardized lengths for each species: northern pike (14 inches), walleye (10 inches), largemouth bass (8 inches), bluegill (3 inches), black crappie (5 inches), pumpkinseed (3 inches) and rock bass (4 inches). Quality lengths used included: northern pike (21 inches), walleye (15 inches), largemouth bass (12 inches) bluegill (6 inches), black crappie (8 inches), pumpkinseed (6 inches) and rock bass (7 inches). Proportional size distribution-preferred (PSD-P) was also calculated for northern pike, walleye, largemouth bass, bluegill, black crappie, pumpkinseed and rock bass to assess the proportion of fish in the population that are a preferred length by anglers. These are based on standardized lengths for each species: northern pike (28 inches), walleye (20 inches), largemouth bass (15 inches), bluegill (8 inches), black crappie (10 inches), pumpkinseed (8 inches) and rock bass (9 inches) (Anderson and Neuman, 1996).

Growth information from northern pike, walleye, largemouth bass, bluegill and black crappie was obtained according to established protocols for each species and included fin rays, dorsal spines, otoliths and scale samples collected throughout the comprehensive fishery survey. Growth data from Lake Ripley was compared to average statewide and south district growth rates utilized in the DNR Fisheries Management Database.

## **Results and Discussion**

A total of 13,056 fish from twenty-one different species were sampled during the 2023 comprehensive fishery survey (Table 2), with the most fish sampled during SNI (Table 3). Bluegill, pumpkinseed and yellow bullhead were abundant. Walleye, northern pike, largemouth bass, black crappie, yellow perch, rock bass, golden shiner and brown bullhead were common.

### **WALLEYE**

In the 2023 SNI, 508 walleye were sampled for a catch rate of 2.9 walleye/net night. This catch rate is slightly above average (55<sup>th</sup> percentile) compared to lakes with similar characteristics across the state (complex fishery with warm water temps and dark water). Lengths ranged from 12.7 to 26.6 inches with an average length of 17.8 inches (Figure 2). In 2016 SNI, 602 walleye were sampled for a catch rate of 3.0 walleye/net night. This catch rate is slightly above average (56<sup>th</sup> percentile) for similar lakes. Lengths ranged from 8.7 to 24.7 inches with an average length of 18.5 inches. In 2023, the percent of walleye over the 15-inch minimum size limit was 83.2%.



This was less than the 96.5% calculated from the 2016 survey. Average relative weight of walleye in Lake Ripley has increased from 90 in 2016 to 92 in 2023.

Of the 508 walleye sampled during the 2023 SNI, 24.5% were female, 72.7% were male and 2.8% were immature/unknown sex. This was nearly identical to the 2016 survey in which 24.9% were female, 72.7% male and 2.4% immature/unknown sex of the 602 sampled walleye. Stocking records indicate that the Rock-Fox strain walleye have been stocked into Lake Ripley from different hatcheries during the last few events at a density of 20 large fingerling per acre every other year.

The size structure of the walleye population has remained relatively similar through both survey years. Walleye PSD values decreased to 83 in 2023 from 99 in 2016, still indicating that a majority of the population is quality sized (equal to or greater than 15 inches). Balanced walleye populations have a PSD of 30-60 (Willis, 1993), indicating there may currently be an unbalanced population in Lake Ripley. PSD-P values, or the proportion of walleye equal to or greater than the preferred length of 20 inches, has increased. In 2023, PSD-P was 21 and in 2016 it was 17, indicating that a larger percentage of walleye in Lake Ripley are greater than the preferred length of 20 inches.

A population estimate was calculated from the 318 marked walleye at large from the 2023 SNI. During the SEI survey, 44 adult walleye were examined for marks with 21 recaptures sampled for a R/C of 0.5 and a Peterson estimate of 666 walleye (95% CI = 502–980) or 1.6 adults per acre with a CV of 15.8%. The population estimate in 2016 was calculated at 963 walleye or 2.3 adults per acre from 289 marked walleye at large with 50 being examined during SEI with 15 recaptures for a R/C of 0.3 (95% CI = 648–1,618) and a CV of 21.6%.

Walleye age estimations ranged from age-2 to age-13, indicating multiple year classes exist and that some level of natural reproduction may be occurring in Lake Ripley. The high frequency of age-4 and age-8 walleye suggests that the 2019 and 2015 stocking events were highly successful. There is a noticeable frequency of walleye at age-5, which may represent some underestimation or overestimation of growth structures versus a successful year of natural reproduction. Walleye growth rates were comparable with statewide and south district averages (Figure 3). Growth rates dropped below the statewide and south district averages at age-10, which correlates with 2013, the last year small fingerling walleye were stocked into the lake. In 2023, male walleye between 15.0 and 15.9 inches were in the 61<sup>st</sup> percentile for growth versus the 51<sup>st</sup> percentile in 2016. Female walleye in 2023 between 18.0 and 18.9 inches were in the 71<sup>st</sup> percentile for growth versus the 24<sup>th</sup> percentile in 2016. A weighted regression of the catch curve for walleye in 2023 showed instantaneous mortality was approximately 14% (Figure 4). Creel data would be a beneficial tool to evaluate angler harvest of walleye and give insight into whether harvest is affecting the density and size structure of walleye in Lake Ripley.

During the 2023 FE survey, 30 walleye were sampled within the 4.3-mile station for a catch rate of 6.9 walleye/mile. Lengths ranged from 11.7 to 26.1 inches with an average length of 16.4 inches (Figure 5). In the 2016 FE, 32 walleye were sampled within the 4.0-mile total station for a catch rate of 8.0 walleye/mile. Lengths ranged from 9.9 to 21.4 inches with an average length of 12.9 inches. Out of the 30 walleye sampled in the 2023 FE, none were aged as young-of-year (YOY). In the 2022 FE, four of the 25 walleye sampled were aged as YOY. In the 2020 FE one walleye out of 31 was aged as YOY, and in the 2018 FE seven out of 31 were aged as YOY (all unstocked years). This shows indications of limited natural reproduction in the lake. Since the DNR no longer stocks walleye in Lake Ripley, future studies should continue to focus on identifying natural reproduction and recruitment of previously stocked fish to determine recruitment into the population through additional FE surveys and aging analysis.

## **NORTHERN PIKE**

In the 2023 SNI survey, 188 northern pike were sampled for a catch rate of 1.1 northern pike/net night. This catch rate is just below average (43<sup>rd</sup> percentile) compared to lakes with similar characteristics across the state (complex fishery, warm temperatures and dark water). Lengths in 2023 ranged from 10.5 to 39.3 inches with an average length of 24.3 inches (Figure 6). In 2016 SNI, the catch rate was 0.9/net night (35<sup>th</sup> percentile) and lengths ranged from 8.7 to 37.6 inches with an average length of 18.0 inches.

The percent of northern pike over the current 26-inch minimum length limit in 2023 SNI was 46.2%, higher than 12.4% calculated in 2016. Northern pike PSD calculated from SNI data was 89 in 2023, indicating that there is now a robust proportion of quality sized northern pike (equal to or greater than 21 inches) present in Lake Ripley. Northern pike PSD was calculated at 38 in 2016. Balanced populations should have a PSD value of 30-60, indicating that there may now be an unbalanced northern pike population in Lake Ripley. PSD-P values showed a similar trend with an increase to 33 in 2023 from 15 in 2016, indicating a greater proportion of preferred size northern pike (equal to or greater than 28 inches) is currently present.

Northern pike body condition was moderate as suggested by  $W_r$  values that ranged from 31 to 144 and averaged 86 (N=162) in 2023. This was similar to  $W_r$  values in 2016 that ranged from 19 to 127 and averaged 88 (N=159). This indicates that the forage base is adequate to maintain the three top predator species (northern pike, walleye and largemouth bass) and density dependent factors are not currently affecting the size structure of northern pike in Lake Ripley.

Northern pike ages ranged from age-1 to age-11, indicating several year classes are present in the lake. Northern pike have not been historically stocked in Lake Ripley. Growth rates of northern pike in Lake Ripley mimicked statewide averages but were significantly slower than south district averages (Figure 7). A weighted regression of

the catch curve for northern pike in 2023 showed instantaneous mortality was approximately 20% and angling mortality was approximately 0% (Figure 8). A population estimate was calculated from the mark and recapture events during SNI. In total, 160 northern pike were marked and 28 were recaptured for a Schnabel estimate of 490 northern pike or 1.2 adults/acre. The lower limit for the estimate was 354 and the upper limit was 792 with a R/C of 0.15. A population estimate in 2016 could not be calculated due to few northern pike being recaptured. In total, 170 northern pike were marked but only six were recaptures. A creel survey would help estimate angler harvest of northern pike in Lake Ripley and provide insight into whether a change to the harvest regulation would benefit the size structure and growth of the population.

During the 2023 SEII, two northern pike were sampled for a catch rate of 0.5/mile. Lengths ranged from 18.7 to 21.4 inches and averaged 20.1 inches. None of the northern pike sampled were marked from SNI.

## **LARGEMOUTH BASS**

During the 2023 SNI, 177 largemouth bass were sampled for a catch rate of 1.0/net night. This is an increase in catch rate from 123 largemouth bass sampled for a catch rate of 0.6/net night in 2016. Largemouth bass do not sample well during fyke net surveys, which is why data collected for this species is focused during SEII. Lengths of largemouth bass sampled in 2023 SNI ranged from 4.5 to 20.3 inches and averaged 10.0 inches. In 2016 SNI, lengths ranged from 4.3 to 20.6 inches and averaged 8.6 inches. In both survey years, approximately 14% of largemouth bass were legal sized (14.0 inches) or larger.

In the 2023 SEII, 177 largemouth bass were sampled for a catch rate of 44/mile. This is in the 77<sup>th</sup> percentile for lakes with similar characteristics. Lengths ranged from 0.7 to 15.6 inches and averaged 10.7 inches (Figure 9). This catch rate is comparable to the 2016 SEII in which 245 largemouth bass were sampled for a catch rate of 61/mile (81<sup>st</sup> percentile), and lengths ranged from 3.5 to 18.3 inches with an average length of 10.2 inches. Largemouth bass PSD was very similar between both survey years with a value of 26 in 2023, and 31 in 2016. This indicates that quality sized largemouth bass (equal to or greater than 12 inches) are present in the population. PSD-P (15 inches) remained low with a value of 3 in both 2023 and 2016, indicating few fish reach a preferred size for the species. Relative weight was average for largemouth bass in 2023 (93), and above average in 2016 (103). In 2023, growth rate was only below the south district average but mimicked statewide averages (Figure 10). Growth rate for largemouth bass in Lake Ripley fell below south district and statewide averages in 2016. A weighted regression of the catch curve of ages 3-8 shows instantaneous mortality is around 21% with an angling mortality of only 1% (Figure 11). This suggests that overharvest is not currently causing the size structure and growth issues of largemouth bass in Lake Ripley. A closer look at size structure and growth will be important in the next survey to monitor the species.

## **BLUEGILL**

During the 2023 SNI, 7,691 bluegill were sampled for a catch rate of 43.7/net night. Lengths ranged from 2.6 to 10.0 inches with an average length of 5.1 inches (Figure 12). In the 2016 SNI, 2,384 bluegill were sampled for a catch rate of 11.8/net night. Lengths ranged from 3.1 to 9.0 inches with an average length of 5.4 inches.

In the 2023 SEII, 48 bluegill were sampled for a catch rate of 48.0/mile. This catch rate is in the 22<sup>nd</sup> percentile for lakes with similar characteristics. Lengths ranged from 2.6 to 8.0 inches and averaged 5.2 inches. In 2016, 44 bluegill were sampled for a catch rate of 44.0/mile (21<sup>st</sup> percentile). Lengths ranged from 2.6 to 7.8 inches and averaged 4.8 inches. PSD values increased during SEII to 44 in 2023 from 23 in 2016. PSD-P values were low throughout with only 2 in 2023 and 0 in 2016. This indicates that a larger proportion of bluegill are reaching quality size (6 inches), however few reach a preferred size of 8 inches.

The average length at age-3 of bluegill was 4.0 inches, indicating moderate growth rates. When compared to statewide averages, length at age of bluegill in Lake Ripley was slower until age-5 where growth in Lake Ripley then exceeded the statewide average. Length at age was much lower than south district averages until age-6 where bluegill growth in Lake Ripley began to closely resemble south district averages (Figure 13). A weighted regression of the catch curve for ages 5-10 was run for bluegill and indicated an instantaneous mortality estimate of approximately 26% and angling mortality approximately 6% (Figure 14). This suggests that angling mortality may not currently be affecting the size structure and growth of bluegill in Lake Ripley, however a creel survey would help to accurately define angler harvest.

## **BLACK CRAPPIE**

During the 2023 SNI on Lake Ripley, 56 black crappie were sampled for a catch rate of 0.3 black crappie/net night. This is a decline from 145 black crappie sampled for a catch rate of 0.7/net night in 2016. Lengths in 2023 ranged from 5.9 to 13.2 inches and averaged 9.1 inches. Lengths in 2016 ranged from 2.8 to 13.0 inches and averaged 5.4 inches (Figure 15). Catch rates in 2023 and 2016 were well below average (less than 1<sup>st</sup> percentile in 2023 and 12<sup>th</sup> percentile in 2016) compared to lakes with similar characteristics. Current DNR protocols do not effectively sample black crappie.

Even though catch rates of black crappie have declined between survey years, PSD values have increased in Lake Ripley. In 2023, PSD was 55, indicating that a majority of black crappie in Lake Ripley are reaching quality sized (8 inches) or larger, in 2016 PSD was 11. PSD-P values (10 inches or greater) also saw an increase as values improved to 39 in 2023 from 11 in 2016. PSD-M (memorable size of 12 inches or greater) values increased to 16 in 2023 from 2 in 2016. This indicates that the size structure of black crappie in Lake Ripley has shifted significantly.

Black crappie growth from age estimations was slower than statewide and south district averages up to age-7 where growth rates met and exceeded these averages for older black crappie (Figure 16). A weighted regression of the catch curve for ages 5-10 in Lake Ripley shows instantaneous mortality to be approximately 22% with an angling mortality of approximately 2% (Figure 17). A creel survey would help to evaluate whether angler harvest is affecting the size structure and growth of black crappie in Lake Ripley. No black crappie were sampled during SEII in either survey year.

## **PUMPKINSEED**

During the 2023 SNI survey, 1,654 pumpkinseed were sampled for a catch rate of 9.4/net night. The average length was 6.0 inches. PSD was 65 indicating that a large percentage of pumpkinseed in Lake Ripley were of quality size (6 inches) or greater. In 2016, a total of 223 pumpkinseed were sampled for a catch rate of 1.1/net night. The average length was 5.3 inches (Figure 18). PSD was 33 indicating that a decent percentage of pumpkinseed were quality size or greater. PSD-P (8 inches) values were 2 for both 2023 and 2016.

During the 2023 SEII survey, 68 pumpkinseed were sampled in 1.0-mile for a catch rate of 68.0/mile (96<sup>th</sup> percentile for lakes with similar characteristics). PSD was 74 indicating a majority of pumpkinseed were quality size or greater. In 2016, 53 pumpkinseed were sampled in 1.0-mile for a catch rate of 53.0/mile (96<sup>th</sup> percentile) and PSD was 36. PSD-P (8 inches) values were 1 in 2023 and 2 in 2016, indicating that very few pumpkinseed are reaching 8.0 inches or greater in Lake Ripley.

## **ROCK BASS**

During the 2023 SNI, 353 rock bass were sampled for a catch rate of 2.0/net night. This was slightly higher than in 2016, where 287 rock bass were sampled for a catch rate of 1.4/net night. Average length in 2023 and 2016 was nearly identical with 6.4 and 6.7 inches, respectively (Figure 19). PSD values (7 inches or greater) indicate a declining trend going to 34 in 2023 from 55 in 2016. PSD-P values (9.0 inches or greater) also declined to 1 in 2023 from 18 in 2016. This indicates that an increasing percentage of rock bass in Lake Ripley are not reaching quality or preferred size.

In the 2023 SEII survey, eight rock bass were sampled for a catch rate of 8.0/mile (50<sup>th</sup> percentile for lakes with similar characteristics) and averaged 6.6 inches. In the 2016 SEII, 12 rock bass were sampled for a catch rate of 12.0/mile (61<sup>st</sup> percentile) and averaged 7.6 inches.

## **YELLOW PERCH**

In the 2023 SNI, 43 yellow perch were sampled for a catch rate of 0.2/net night. This catch rate is well below average (9<sup>th</sup> percentile) compared to lakes with similar characteristics. Lengths ranged from 4.7 to 8.2 inches and averaged 6.9 inches. In 2016, 20 yellow perch were sampled for a catch rate of 0.1/net night. This catch rate

was also well below average (4<sup>th</sup> percentile). Lengths ranged from 5.2 to 7.7 inches and averaged 6.0 inches. Too few yellow perch were sampled to calculate PSD values, however few fish from any sampling year reached quality size (8 inches) or greater. Current DNR protocols do not sample yellow perch well.

During the 2023 SEII survey, six yellow perch were sampled for a catch rate of 6.0/mile. Lengths ranged from 4.7 to 8.2 inches and averaged 6.9 inches. In 2016, 17 yellow perch were sampled for a catch rate of 17.0/mile. Lengths ranged from 3.6 to 6.8 inches and averaged 5.1 inches.

## **COMMON CARP**

In the 2023 SEII, a total of 28 common carp were sampled for a catch rate of 28.0 per mile. This catch rate is well above average (over 99<sup>th</sup> percentile) compared to lakes with similar characteristics. In the 2016 SEII, no common carp were sampled. This may suggest that the carp barrier installed by the Lake Ripley Management district in 2021 on the outlet of the lake may have an unforeseen negative effect of keeping carp in the lake. Currently, the population of carp within the lake is not affecting aquatic macrophytes and water clarity. A closer look at carp abundance is warranted for future surveys.

## **OTHER SPECIES**

Other species sampled during the 2023 SNI included: bigmouth buffalo, black bullhead, bowfin, brown bullhead, creek chub, golden shiner, lake chubsucker (State Special Concern species), smallmouth bass, white sucker and yellow bullhead. These fish can play an important role in the trophic status of the lake. Catch rates of these species was highly variable during SNI in Lake Ripley from 2016 to 2023. One species of note is the grass pickerel that was sampled in 2016 but not in 2023.

# **Management Recommendations**

The walleye catch rate in Lake Ripley shows a slight decline to 1.6/acre in 2023 from 2.3/acre in 2016, however both are slightly above average for lakes with similar characteristics. The average length and PSD also showed declines to 17.8 inches and a value of 83 in 2023 from 18.5 inches and a value of 99 in 2016. This suggests that the size structure is still unbalanced, and while large, older fish are surviving, young fish may not be recruiting at optimum levels. Walleye age estimations denoted that several year classes and young-of-year walleye have been sampled in FE sampling during unstocked years, indicating that some level of natural reproduction is occurring. Given that the large fingerling walleye stocking was discontinued after 2021, and a statewide walleye regulation was enacted in 2024 reducing the bag limit from five fish to three, changes to the catch rate and the size structure of walleye in Lake Ripley should be a focus for future surveys. Relative weight increased slightly,



suggesting that the forage base is currently adequate for the gamefish in Lake Ripley. Growth rates for walleye continue to mirror south district and statewide averages. Both male and female average age at lengths improved in 2023 with males 15.0-15.9 increasing to the 61<sup>st</sup> percentile (51<sup>st</sup> percentile in 2016) and females 18.0-18.9 having the largest increase to the 71<sup>st</sup> percentile (24<sup>th</sup> percentile in 2016). A creel survey would assist in determining if angler harvest is having any effect on the size structure or growth of walleye in Lake Ripley.

The northern pike in Lake Ripley showed increases in catch rate, average length, PSD, PSD-P, and relative weight, but the current PSD value indicates an unbalanced population. The population estimate for 2023 was 1.2/acre in the absence of any stocking indicating natural reproduction in the lake is supporting the species. The growth rate of northern pike has mimicked statewide averages but falls below south district averages. A creel survey could better define the angler harvest of northern pike in Lake Ripley. Future surveys should look at age and growth metrics to define if the population has a growth issue based on competition with other species.

Catch rates for largemouth bass during the SEII were very similar between 2016 and 2023. Catch rates were in the 77<sup>th</sup> percentile in 2023 and PSD was fair. Relative weight decreased to average in 2023 from above average in 2016. The growth rate in 2023 improved from 2016 to closer resemble both statewide and south district averages. Future surveys should continue to focus on taking weights and age structures to monitor the largemouth bass population and help determine whether competition with other species is causing growth issues.

Catch rates of bluegill increased dramatically during the SNI to 44/net night in 2023 from 12/net night in 2016. A large amount of 4-inch bluegill were sampled that caused PSD values to decline to 23 in 2023 from 33 in 2016. Average length at age data suggests the population is moderately fast growing and the growth rate is below statewide and south district averages until age-5 where they exceed statewide and mimic south district averages. The estimated angling mortality is low at 1%. A creel survey would better estimate angler harvest of bluegill. PSD-P values were low in both years, so a more restrictive bag limit may benefit the size structure and growth of bluegill in Lake Ripley.

DNR protocols do not sample black crappie well. Catch rates of black crappie during SNI are below average (less than 1<sup>st</sup> percentile in 2023 and 12<sup>th</sup> percentile in 2016). Black crappie do not get sampled during SEII in Lake Ripley. Average length of black crappie increased dramatically to 9.1 inches in 2023 from 5.4 inches in 2016. PSD has also increased dramatically to 55 from 11 while PSD-P has increased to 39 from 11. Growth rate of black crappie in Lake Ripley was slower than statewide and south district averages until age-7. Angling mortality was calculated at around 2%. Future surveys should concentrate on length, weight and age data to monitor the trends in this species.

Yellow perch catch rates have been well below average for SNI on Lake Ripley. Due to the low number of fish sampled, PSD values were not calculated. Low numbers of quality (8 inch) and no preferred (10 inch) yellow perch were sampled during surveys in Lake Ripley. Length, weight and age data should be collected in future surveys to monitor the trends in this species. Five thousand yearling yellow perch were stocked in both 2018 and 2019. These fish were not sampled in any survey. Predation from other fish and competition for available food may be comingling factors affecting yellow perch in Lake Ripley.

Currently, the northern pike, walleye and largemouth bass populations appear to be stable. Catch rates of bluegill, black crappie, and yellow perch were below average and more restrictive regulations may be warranted. Any changes to the current fishing regulations should be a focus of the next survey and potential solutions should be vetted with local stakeholders to drive the management of the fishery of Lake Ripley.

Common carp catch rates should be closely monitored along with water quality to evaluate their abundance and effects on Lake Ripley. Manipulation of the carp barrier should be investigated, and adjustments to the placement and removal of the structure should be considered.

**Management recommendations include:**

1. Monitor the northern pike population and reevaluate size structure, abundance, growth, length at age, relative weight and conduct a population estimate in the next comprehensive fishery survey. Monitor the abundance of quality and preferred sized northern pike.
2. Monitor the walleye population and reevaluate size structure, abundance, growth, length at age, relative weight, sex ratio and conduct a population estimate in the next comprehensive fishery survey. Continue FE to estimate natural reproduction in the lake and observe year-class strength.
3. Monitor the largemouth bass population and reevaluate size structure, abundance, growth, length at age and relative weight in the next comprehensive fishery survey.
4. Monitor the black crappie population to evaluate size structure, abundance, growth, length at age and relative weight in the next comprehensive fishery survey. Improve catch rates and PSD by exploring potential regulation changes to reduce harvest and protect the population.
5. Monitor the bluegill population and reevaluate size structure, abundance, growth, length at age and relative weight in the next comprehensive fishery survey. Improve catch rates and PSD by exploring potential regulation changes to reduce harvest and protect the population.
6. Monitor the yellow perch population to evaluate size structure, abundance, growth, length at age and relative weight in the next comprehensive fishery

survey. Improve catch rates and PSD by exploring potential regulation changes to reduce harvest and protect the population.

7. Monitor the relative abundance of the common carp (*Cyprinus carpio*) population, via catch rates, in the next comprehensive fishery survey.
8. If funding is available, conduct a lake-wide creel survey to estimate angler harvest of all fish species in Lake Ripley.

## Tables

Table 1. Fish stocking history 2005-2021 from both WDNR and private hatchery in Lake Ripley, Jefferson County, WI.

Year	Species	Age Class	Number Stocked
2005	WALLEYE	SMALL FINGERLING	1350
2006	WALLEYE	LARGE FINGERLING	4180
2009	WALLEYE	SMALL FINGERLING	14630
2010	WALLEYE	SMALL FINGERLING	4966
2010	WALLEYE	SMALL FINGERLING	2558
2011	WALLEYE	SMALL FINGERLING	14630
2013	WALLEYE	SMALL FINGERLING	14630
2015	WALLEYE	LARGE FINGERLING	4519
2017	WALLEYE	LARGE FINGERLING	8396
2018	YELLOW PERCH	YEARLING	5000
2019	WALLEYE	LARGE FINGERLING	8360
2019	YELLOW PERCH	YEARLING	5000
2021	WALLEYE	LARGE FINGERLING	3000
2021	WALLEYE	LARGE FINGERLING	1305
2021	WALLEYE	LARGE FINGERLING	4055

Table 2. Catch summary of all gear types in 2023 on Lake Ripley, Jefferson County, WI.

ALL GEARS	2023			
Common Name	Number	Percent	Average Length	Length Range (Inches)
Bigmouth Buffalo	3	0.02		
Black Bullhead	6	0.04	12.3	10.7-13.4
Black Crappie	56	0.43	9.1	5.9-13.2
Bluegill	7739	59.28	5.1	2.6-10.0
Bluegill x Pumpkinseed	9	0.07	5.1	3.5-7.8
Bowfin	16	0.12	22.7	19.9-27.4
Brown Bullhead	320	2.45	12.2	7.7-14.5
Common Carp	35	0.27	10.8	6.7-27.1
Creek Chub	1	0.01	8.1	
Golden Shiner	67	0.51	7.5	3.5-9.4
Lake Chubsucker	4	0.03	7.6	7.0-8.0
Largemouth Bass	354	2.71	10.3	4.3-20.3
Mudpuppy	35	0.27	12.6	10.5-16.0
Northern Pike	194	1.49	24.2	10.5-39.3
Pumpkinseed	1722	13.19	6.0	2.9-8.3
Rock Bass	520	3.98	6.4	3.3-10.3
Smallmouth Bass	11	0.08	13.4	9.4-19.8
Walleye	604	4.63	17.4	9.1-26.6
White Sucker	21	0.16	16.6	5.9-21.6
Yellow Bullhead	1290	9.88	9.8	5.9-13.8
Yellow Perch	49	0.38	6.6	4.4-9.3
<b>Total</b>	<b>13,056</b>	<b>100.00%</b>		

Table 3. Catch summary of the 2023 spring fyke netting (SNI) of Lake Ripley, Jefferson County, WI.

	<b>2023</b>				
Common Name	Number	Percent	Average Length	Length Range (Inches)	#/Net Night
Bigmouth Buffalo	2	0.02			0.01
Black Bullhead	6	0.05	12.3	10.7-13.4	0.03
Black Crappie	56	0.44	9.1	5.9-13.2	0.32
Bluegill	7691	61.06	5.1	2.6-10.0	43.70
Bluegill x Pumpkinseed	9	0.07	5.1	3.5-7.8	0.05
Bowfin	15	0.12	22.8	19.9-27.4	0.09
Brown Bullhead	320	2.54	12.2	7.7-14.5	1.82
Common Carp	7	0.06	10.8	6.7-27.1	0.04
Creek Chub	1		8.1		0.01
Golden Shiner	64	0.51	7.5	3.5-9.4	0.36
Lake Chubsucker	4	0.03	7.6	7.0-8.0	0.02
Largemouth Bass	177	1.41	10.0	4.5-20.3	1.01
Mudpuppy	35	0.28	12.6	10.5-16.0	0.20
Northern Pike	188	1.49	24.3	10.5-39.3	1.07
Pumpkinseed	1654	13.13	6.0	2.9-8.3	9.40
Rock Bass	512	4.06	6.4	3.3-10.3	2.91
Smallmouth Bass	10	0.08	13.2	9.4-19.8	0.06
Walleye	508	4.03	17.8	12.7-26.6	2.89
White Sucker	18	0.14	16.5	5.9-21.6	0.10
Yellow Bullhead	1276	10.13	9.8	5.9-13.8	7.25
Yellow Perch	43	0.34	6.5	4.4-9.3	0.24
<b>Total</b>	<b>12596</b>	<b>99.99%</b>			<b>71.58</b>

# Figures



Figure 1. Contour map of Lake Ripley in Jefferson County, Wisconsin.



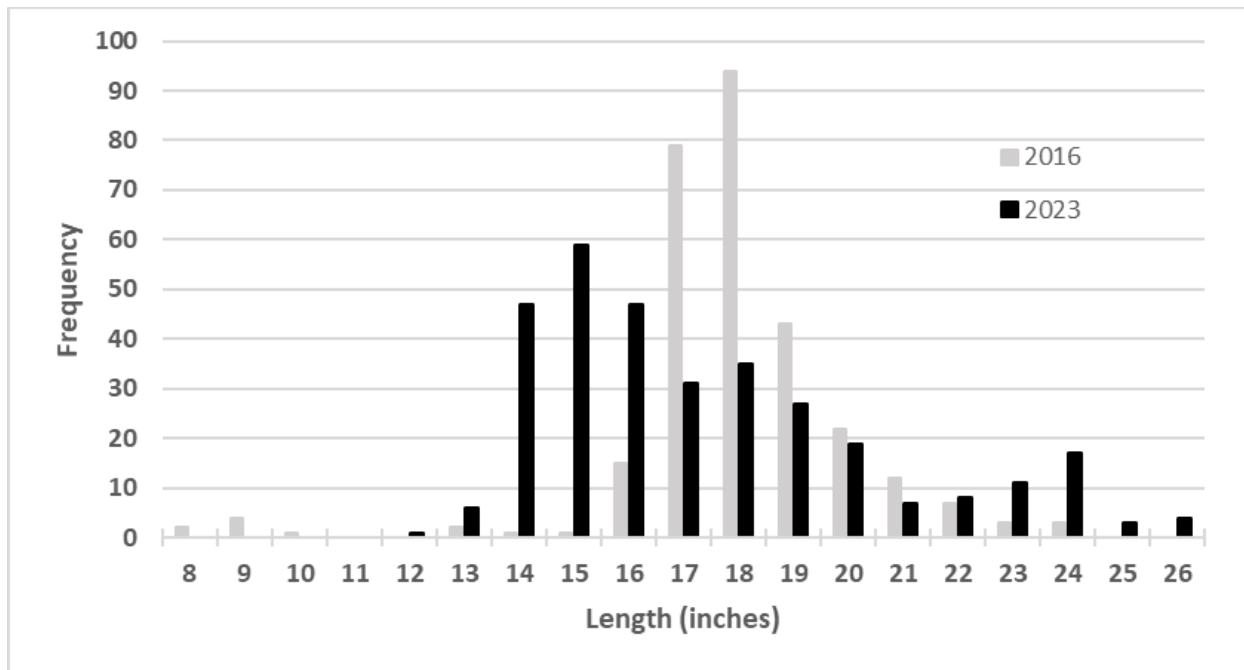


Figure 2. Length-frequency histogram of walleye sampled during the 2016 and 2023 spring fyke netting (SNI) surveys of Lake Ripley, Jefferson County, WI.

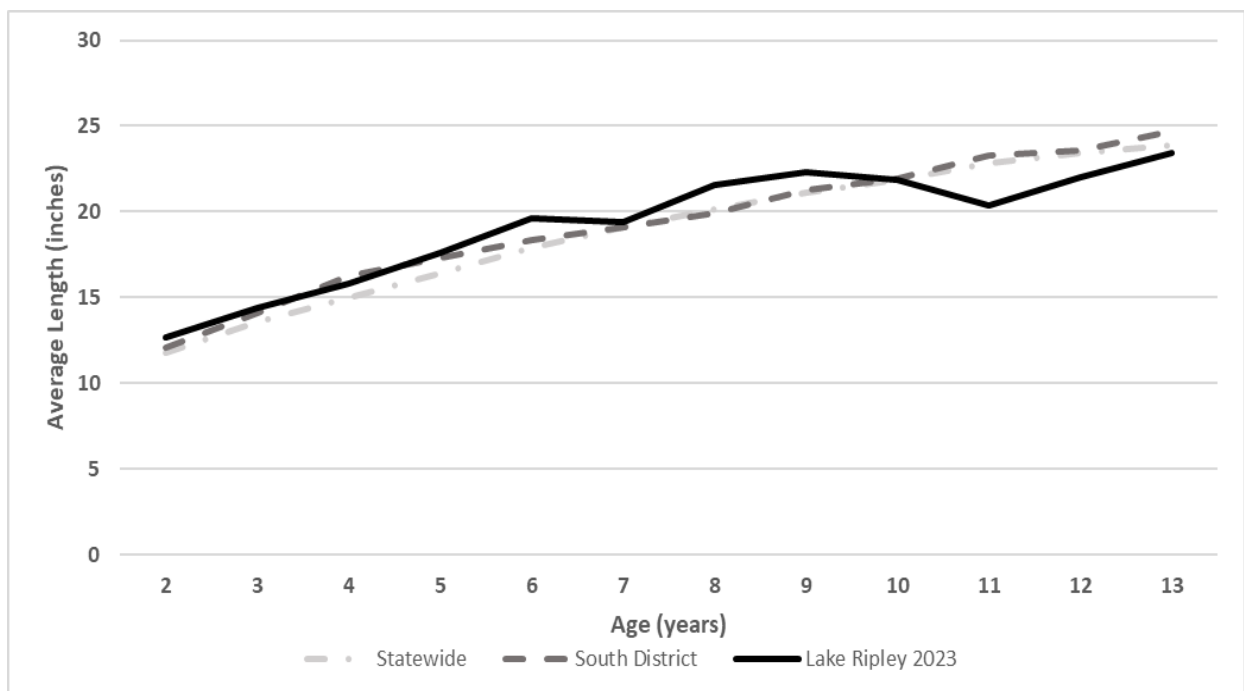


Figure 3. Walleye mean length at age compared to statewide and south district averages determined using dorsal spines collected during the 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

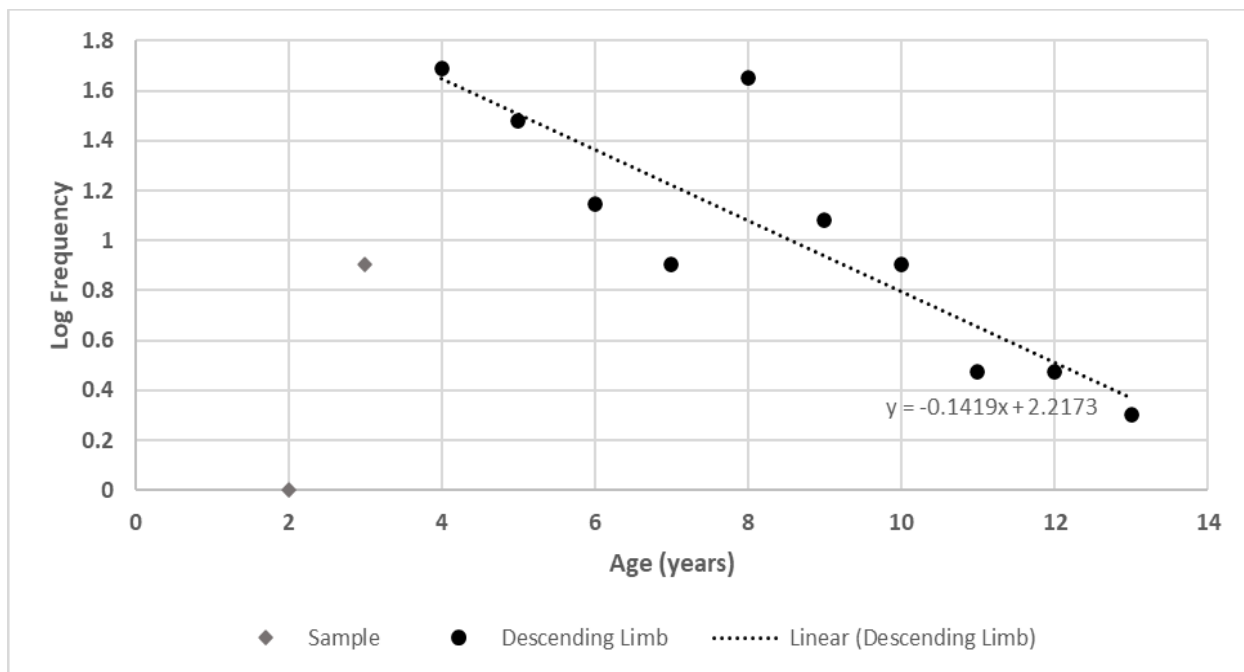


Figure 4. Walleye catch curve for Lake Ripley, Jefferson County calculated from fish sampled during the 2023 spring fyke netting (SNI) survey.  $Z=0.14$ ,  $S=0.87$ ,  $A=0.13$ ,  $F=0.00$ , Ages 4-13.

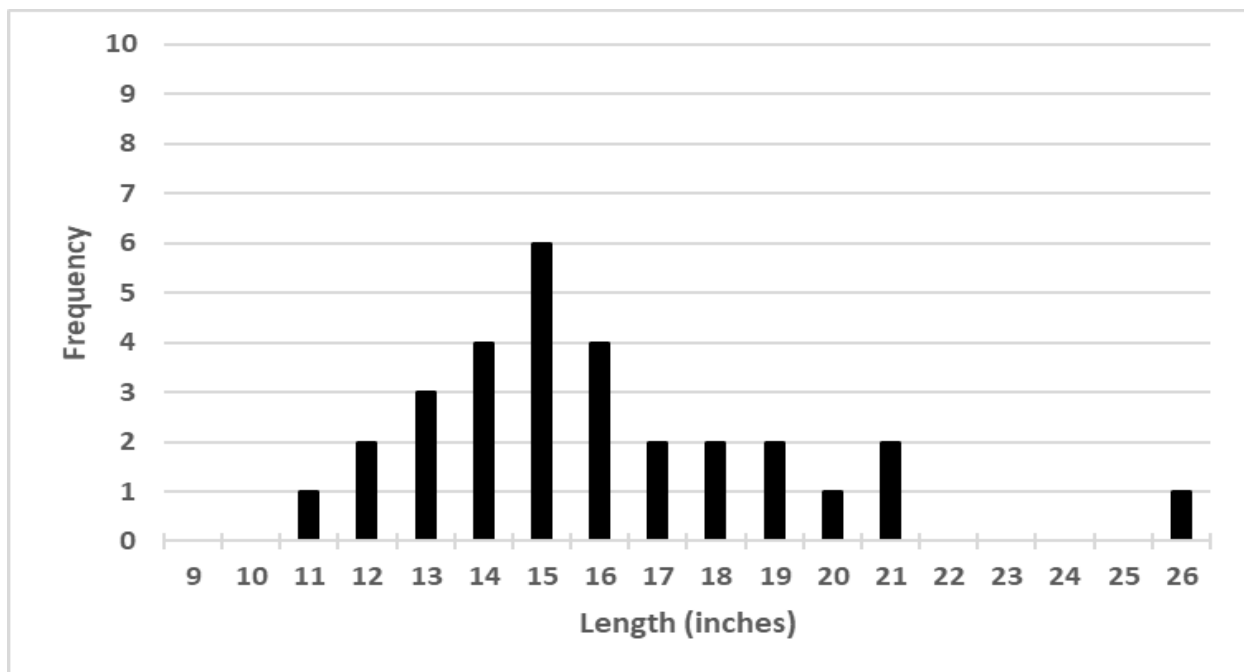


Figure 5. Length-frequency histogram of walleye sampled during the 2023 fall electrofishing (FE) survey of Lake Ripley, Jefferson County, WI.

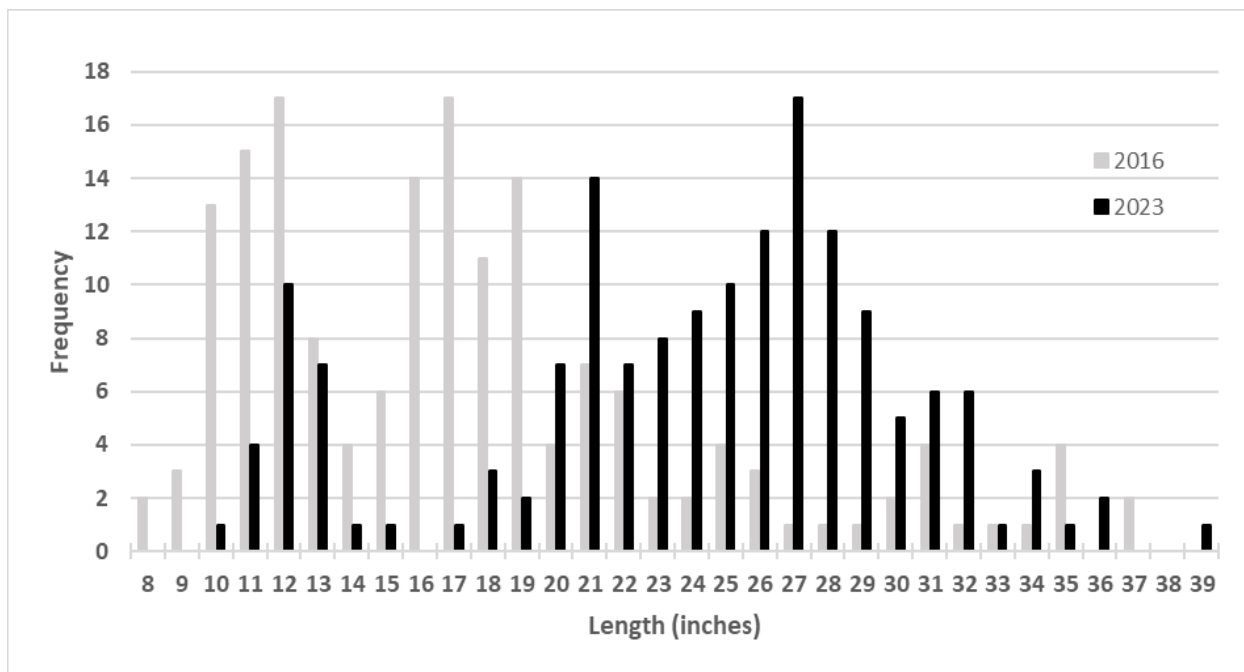


Figure 6. Length-frequency histogram of northern pike sampled during the 2016 and 2023 spring fyke netting (SNI) surveys of Lake Ripley, Jefferson County, WI.

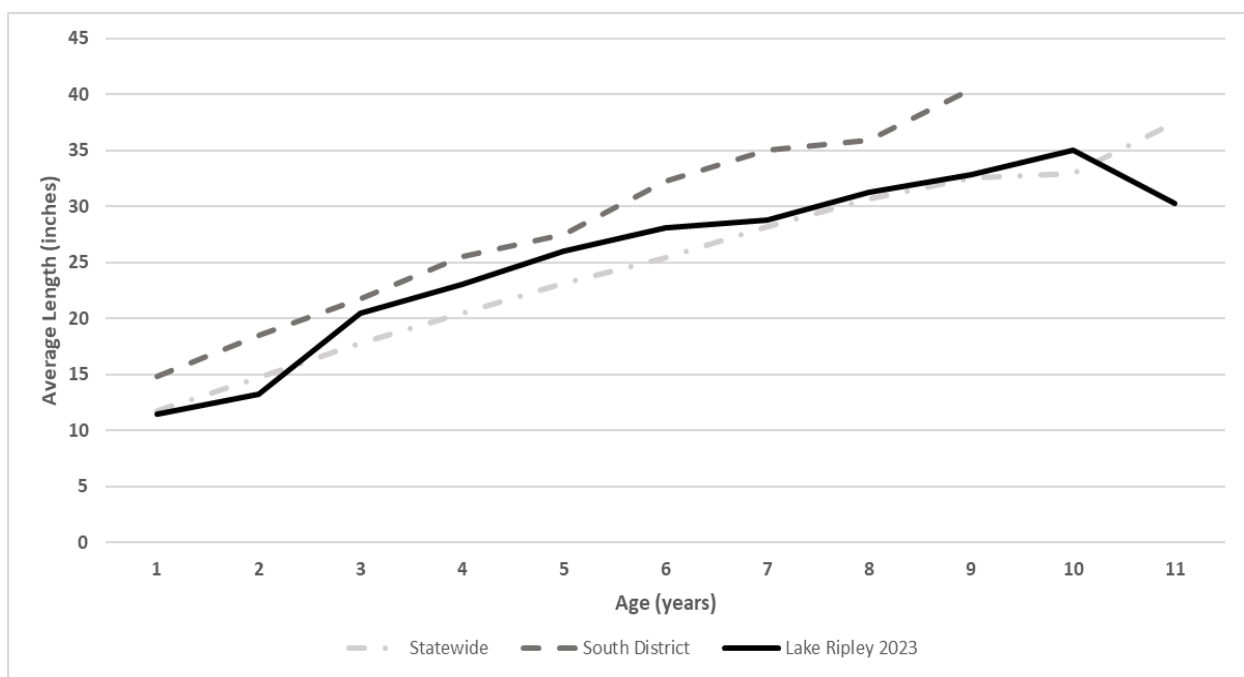


Figure 7. Northern pike mean length at age compared to statewide and south district averages determined using pelvic fin rays collected during the 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

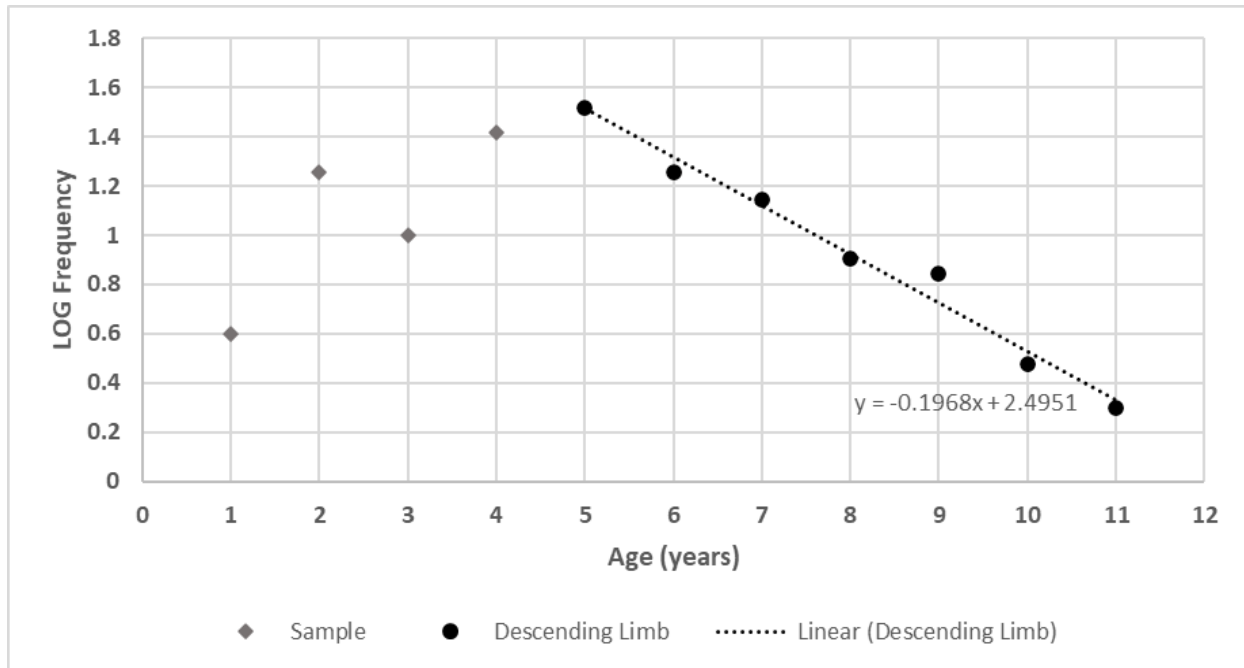


Figure 8. Northern pike catch curve calculated from fish sampled during the 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.  $Z=0.20$ ,  $S=0.82$ ,  $A=0.18$ ,  $F=0.00$ , Ages 5-11.

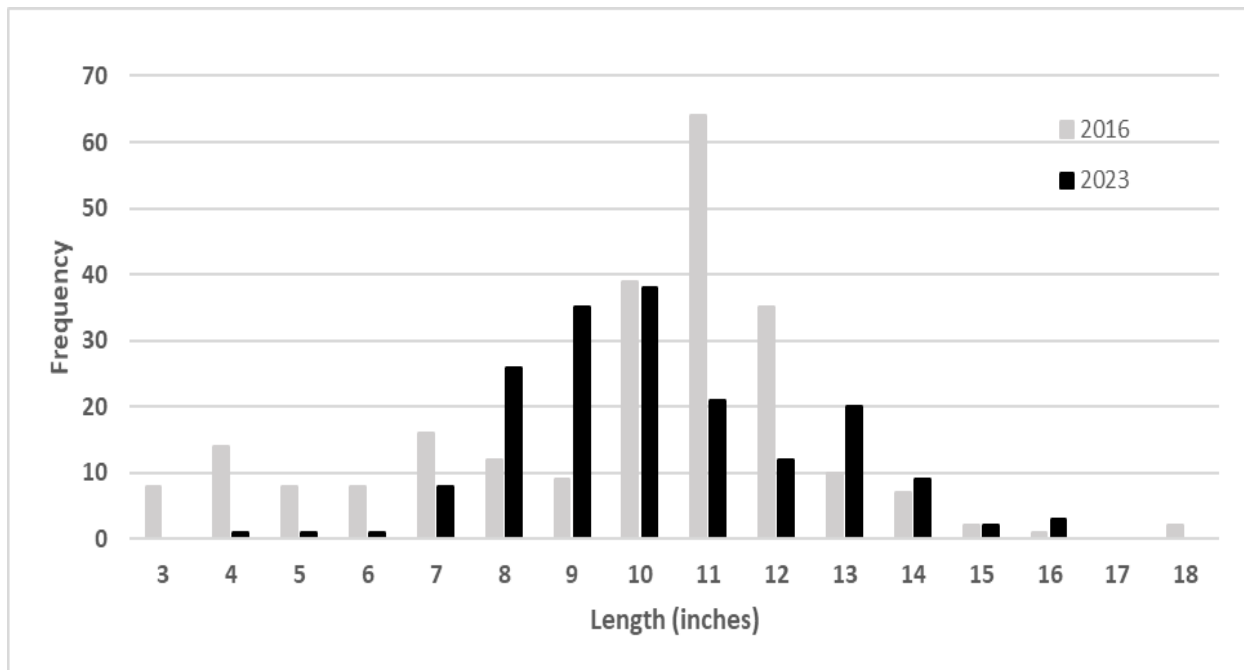


Figure 9. Length-frequency histogram of largemouth bass sampled during the 2016 and 2023 spring electrofishing II (SEII) survey of Lake Ripley, Jefferson County, WI.

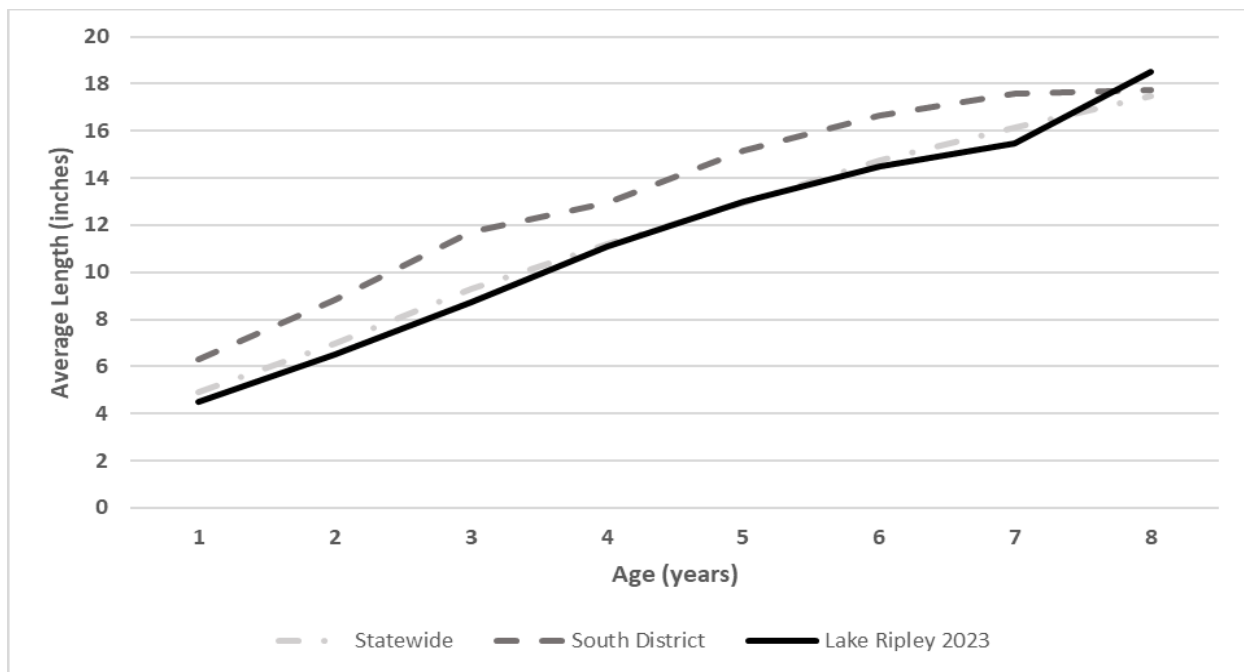


Figure 10. Largemouth bass mean length at age compared to statewide and south district averages determined using anal fin rays, spines and scales collected during the 2023 spring fyke netting (SNI) and 2023 spring electrofishing II (SEII) survey of Lake Ripley, Jefferson County, WI.

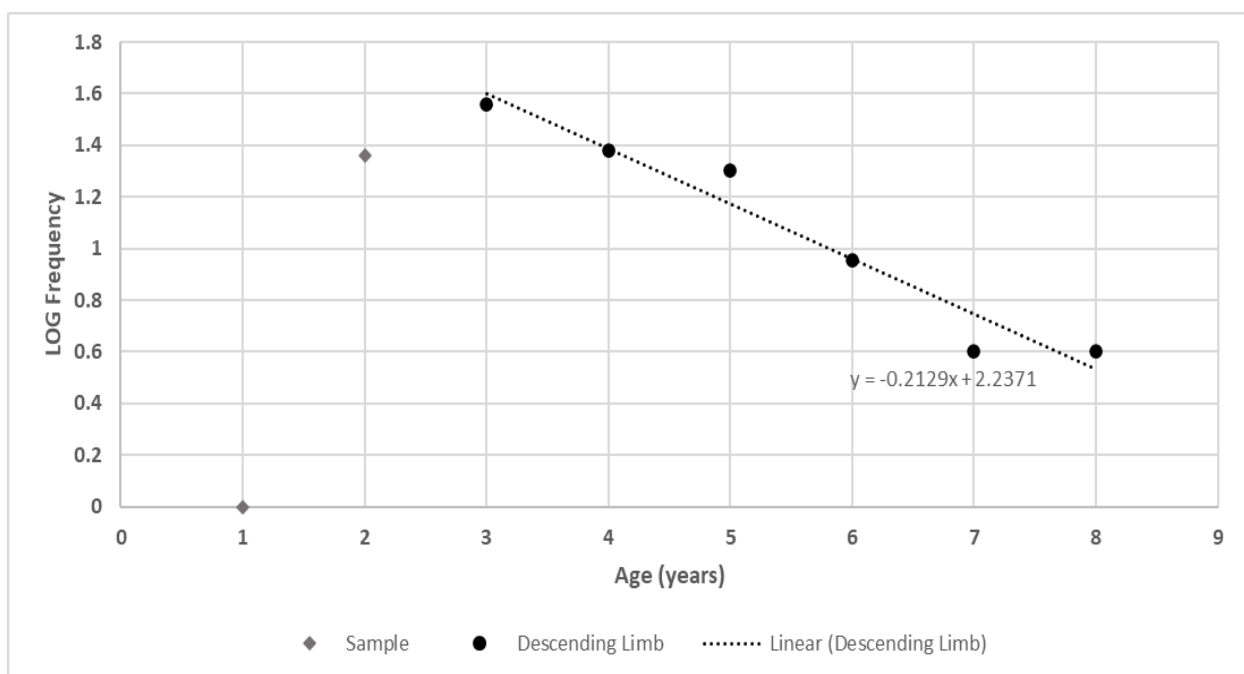


Figure 11. Largemouth bass catch curve calculated from fish sampled during the 2023 spring fyke netting (SNI) and spring electrofishing II (SEII) surveys of Lake Ripley, Jefferson County, WI.  $Z=0.21$ ,  $S=0.81$ ,  $A=0.19$ ,  $F=0.01$ , Ages 3-8.

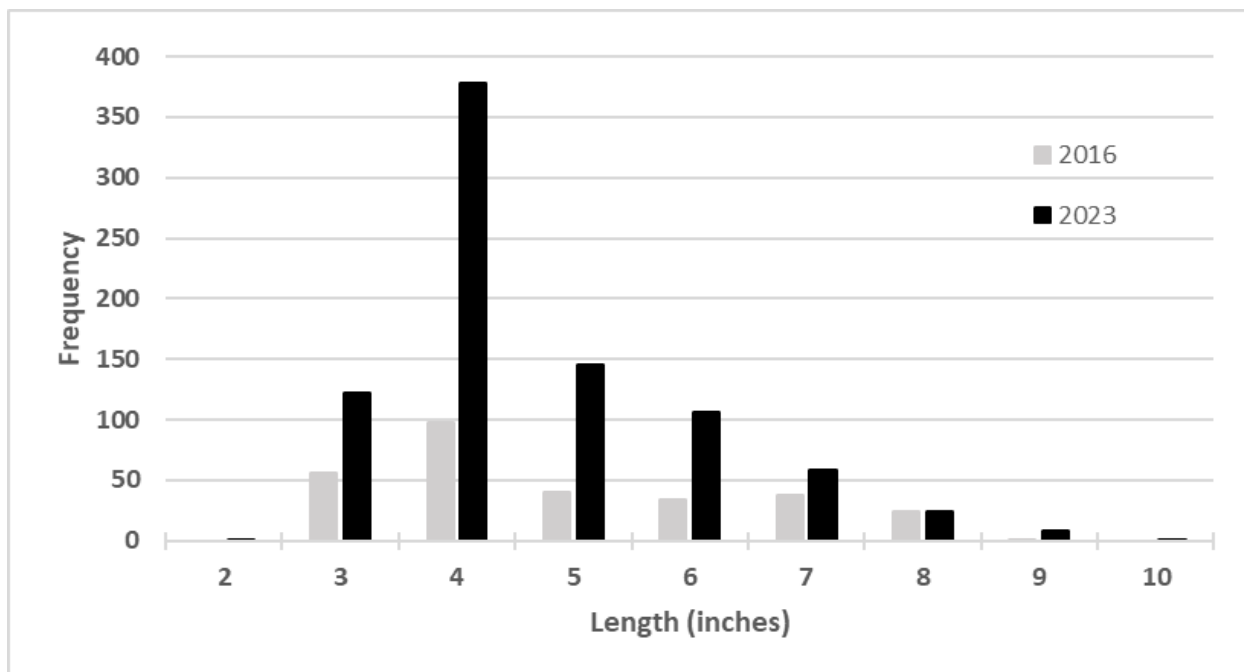


Figure 12. Length-frequency histogram of bluegill sampled during the 2016 and 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

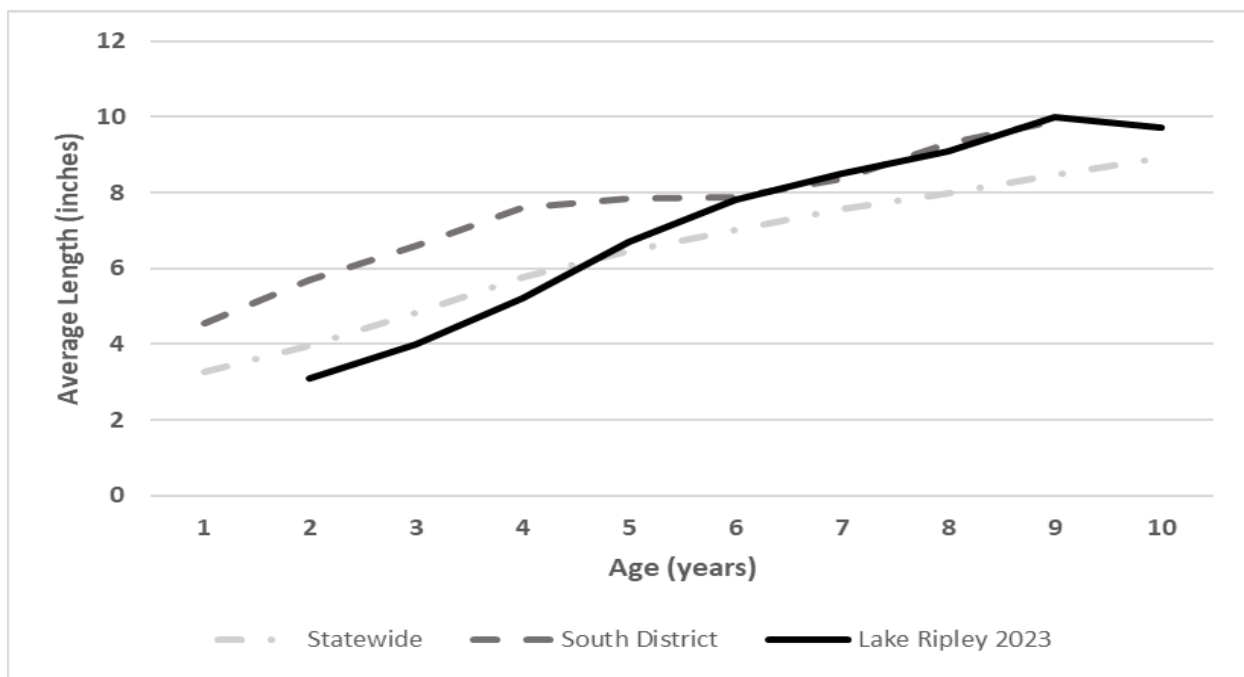


Figure 13. Bluegill mean length at age compared to statewide and south district averages determined using otoliths collected during the 2023 spring fyke netting (SNI) and spring electrofishing II (SEII) survey of Lake Ripley, Jefferson County, WI.



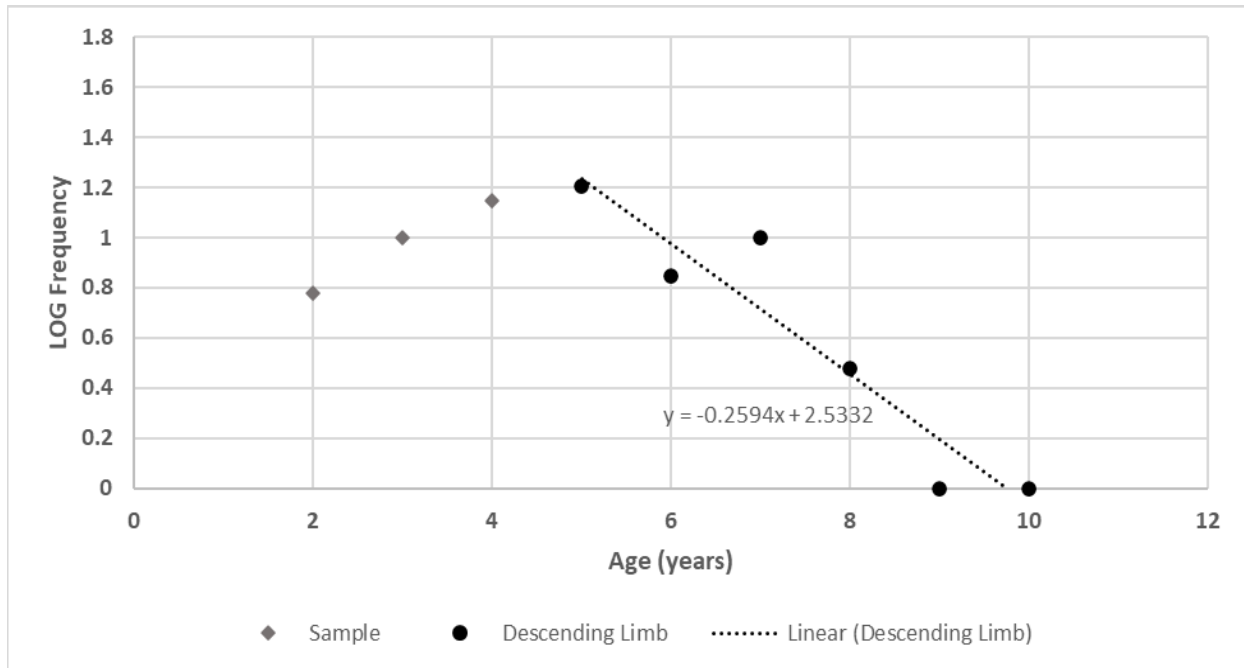


Figure 14. Bluegill catch curve calculated from fish sampled during the 2023 spring fyke netting (SNI) and spring electrofishing II (SEII) survey of Lake Ripley, Jefferson County, WI.  $Z=0.26$ ,  $S=0.77$ ,  $A=0.23$ ,  $F=0.06$ , Ages 5-10.

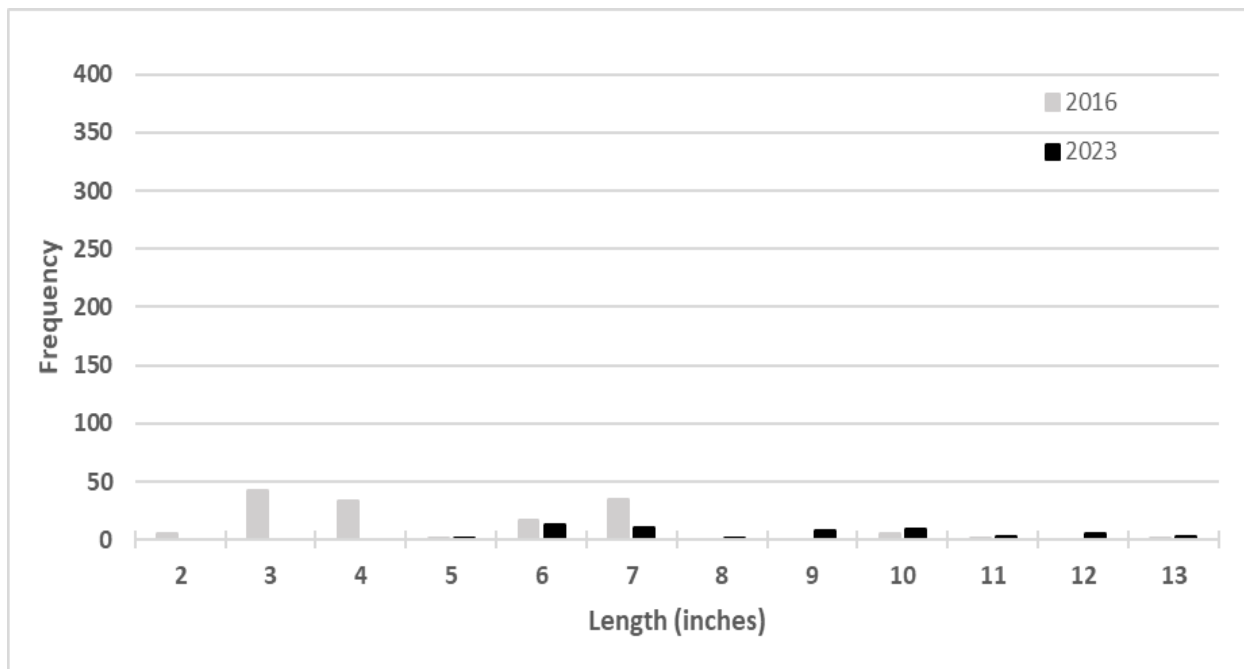


Figure 15. Length-frequency histogram of black crappie sampled during the 2016 and 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

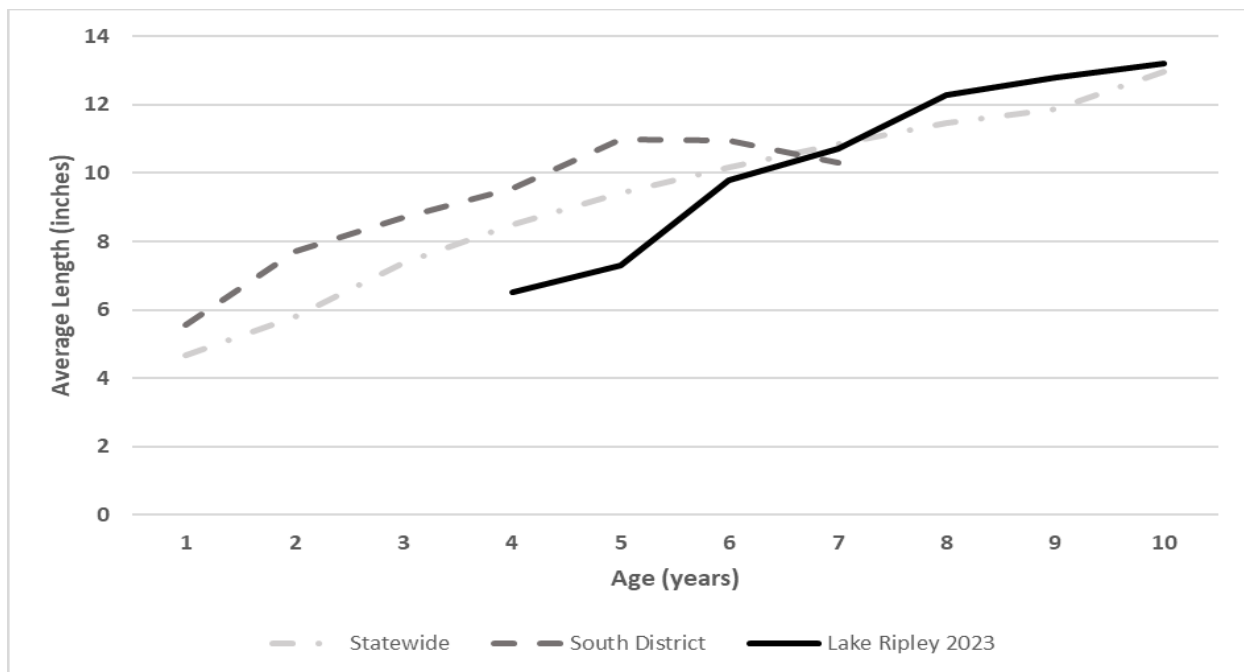


Figure 16. Black crappie mean length at age compared to statewide and south district averages determined using otoliths collected during the 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

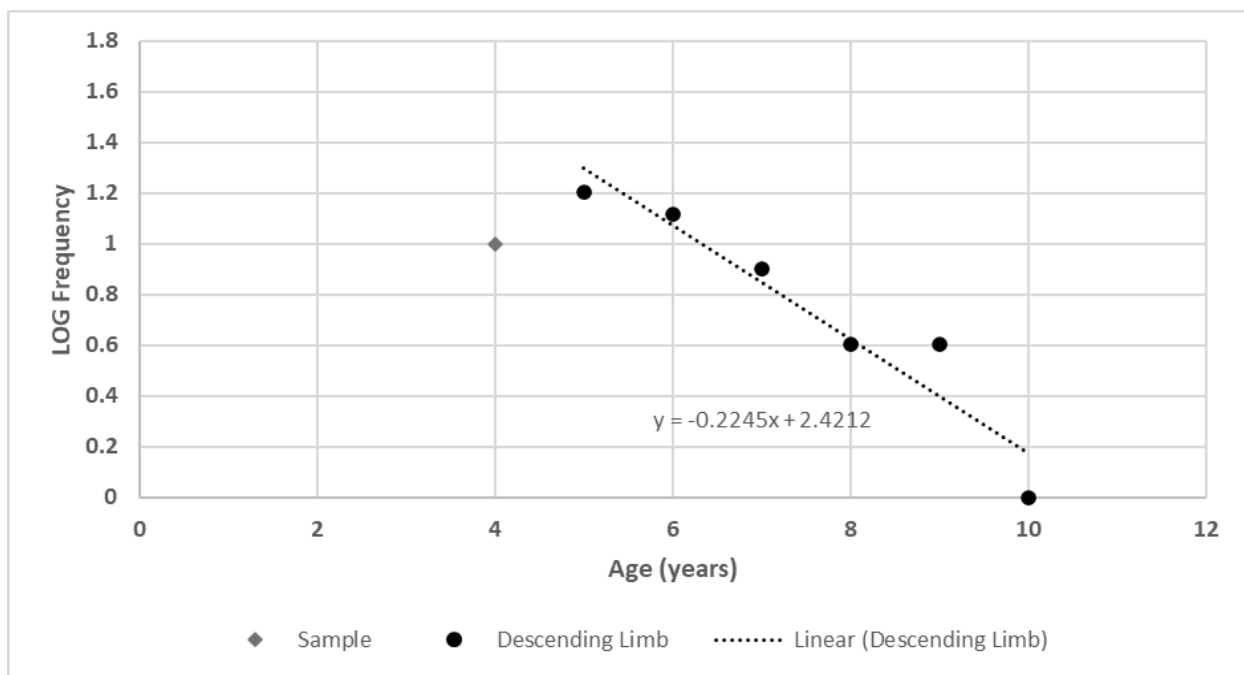


Figure 17. Black crappie catch curve calculated from fish sampled during the 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.  $Z=0.22$ ,  $S=0.80$ ,  $A=0.20$ ,  $F=0.02$ , Ages 5-10.

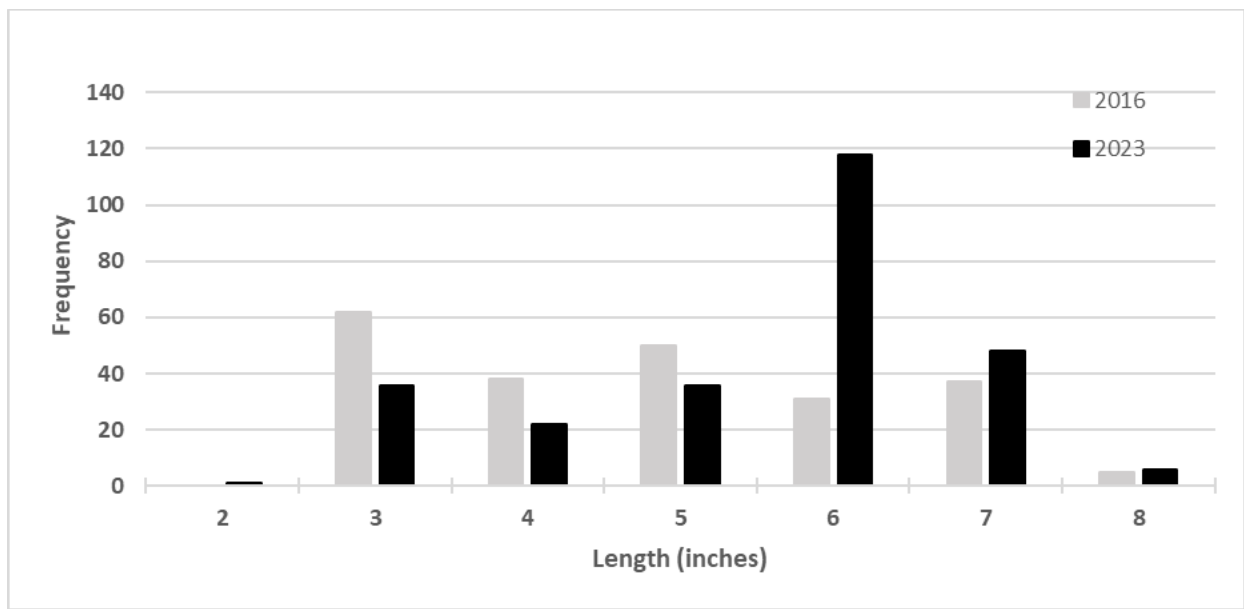


Figure 18. Length-frequency histogram of pumpkinseed sampled during the 2016 and 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

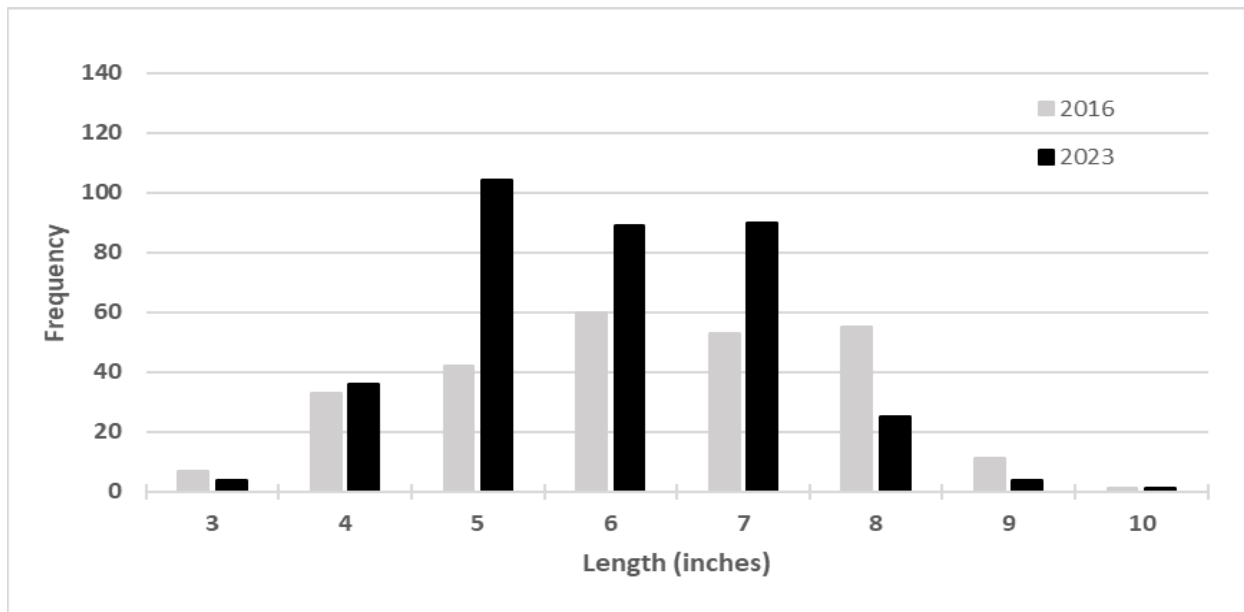


Figure 19. Length-frequency histogram of rock bass sampled during the 2016 and 2023 spring fyke netting (SNI) survey of Lake Ripley, Jefferson County, WI.

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The field work, data collection, scale, spine, fin ray and otolith aging and data entry required for this survey was conducted by DNR Fisheries Technicians Mark Baldock and Megan Drymalski, and DNR Fisheries Biologist Kristina Pechacek. Report reviews and editing were provided by DNR Fisheries Management staff including Laura Stremick, Kristina Pechacek and Tim Simonson.

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